Everybody Counts

The Public Health Workforce in Washington State

Washington State Department of Health

April 2004

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http://www2.doh.wa.gov/phip/survey/everybodycounts/

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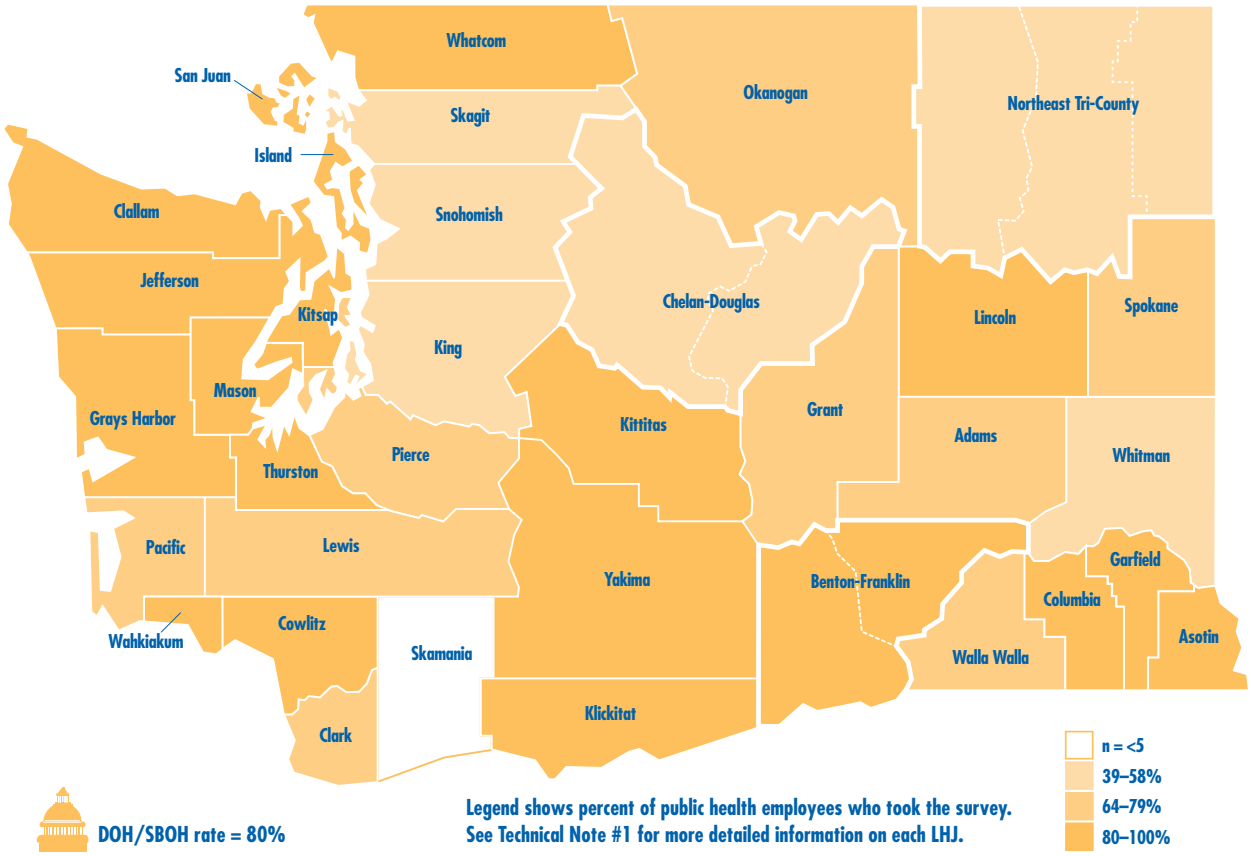


Note: The number of respondents in some LHJs was very small. To protect confidentiality and produce reliable estimates, local results are presented by Public Health Emergency Preparedness and Response (PHEPR) region. PHEPR regional tables are available online at http://www2.doh.wa.gov/phip/survey/everybodycounts/ .

Introduction

Our state's governmental public health system has a straightforward mission: "Always working for a safer and healthier Washington." But describing *who* works toward these goals, what they do in their jobs, the skills and abilities they bring to them, and where they work has not been done until now.

For Washington State to maintain its capacity to respond to the range of emerging health threats—from West Nile virus to bioterrorism—we must have an adequate public health workforce throughout the state. This report explains how the Washington State Department of Health (DOH) conducted the state's first census of its public health workforce, ***Everybody Counts***, and what it revealed.

About 5,400 people work for state and local public health agencies in Washington. Our public health leaders need information about them to anticipate workforce shortages, to plan for workers' recruitment and retention, to develop and target training and education opportunities, and to build a workforce that reflects the diverse cultures and ethnicities of the state.

Limitations of this Study

Everybody Counts focuses on people who work in government public health agencies, for local health departments and districts and for DOH. We view this survey as just a first step in identifying and characterizing public health practice in Washington State. A more comprehensive profile could follow, when resources allow, and it would include employees of community-based agencies, hospitals and other providers of personal health services with whom public health departments partner, other state agencies that employ significant numbers of public health

professionals, Native American tribes, and even the educational institutions that contribute to the workforce and formulate public health theories and methods. It could also assess training needs of the state's current governmental health workers.

(Other study limitations are discussed in the Technical Notes that begin on page 21.)

Background and Methods

State and national health policy makers have been urging a public health workforce census for at least the past decade. The Workforce Development Committee of the state's Public Health Improvement Partnership (PHIP) recommended that the state "collect data that will accurately describe the public health workforce, allowing for comparisons of capacity across jurisdictions and by program or type of work." During the late 1990s, a related study described characteristics of the state's public health workers. A 1997 University of Washington study[1] used a mailed questionnaire to professional employees of DOH, local health jurisdictions (LHJs), and migrant and Indian clinics. This survey generated a group profile of generally white, college-educated workers whose tasks varied widely according to their work venues.

A federal study[2] conducted in 2000 used secondary data sources and encompassed a broad range of health professionals, including paid and volunteer emergency responders, which resulted in workforce size estimates that were far greater than what is found in local and state government public health agencies.

[1] A Profile and Training Needs Assessment of Community Public Health Professionals in Washington State (http://healthlinks.washington.edu/nwcphp/pdf/trainingneeds.pdf)

[2] The Public Health Workforce, Enumeration 2000, Health Resources and Services Administration (http://www.uic.edu/sph/prepare/courses/ph410/resources/phworkforce2000.pdf)

The federal emergency preparedness and response funding and requirements that were directed to the states following the September 2001 attacks called for investments in personnel and planning at both the local and state level—increasing the urgency of obtaining both a reliable count of current public health workers and additional information about public health jobs to project staff needs. During 2003, the Enumeration Subcommittee of the PHIP Workforce Development Committee resolved to conduct an online survey with the following characteristics that defined its scope and focus:

- We would limit participation to employees of DOH, the State Board of Health (SBOH), and the state's 35 local public health jurisdictions.
- The survey would create a "point in time" picture of the state's governmental public health workforce.
- We would include all employees of these local and state public health agencies—not only selected professional categories—in the enumeration.
- The survey would collect demographic information such as age, race, and ethnicity.
- The survey would include information about education as well as licenses and certificates.
- We would ask questions to align respondents with specific work tasks and functions so the survey data show what workers do.

The state's annual Joint Conference on Health, a meeting that draws participants from throughout Washington's public health system, provided an opportunity for 160 people to pilot-test the survey in October 2003. Based on the results of the pilot, the Subcommittee made final revisions to the survey and placed it online during November and December 2003. To encourage participation, the Subcommittee implemented a

communications plan with the DOH and LHJ executive leadership that mobilized personal contacts in each participating agency and DOH division and used posters, payroll-stuffers, and fact sheets. In e-mails, we urged employees to take the survey, a process facilitated by internet links. (The full survey is available online at http://www2.doh.wa.gov/phip/survey/everybodycounts/ .)

By the end of the year, 3,501 public health workers had taken the survey. The overall response rate—calculated as the number of participants divided by the sum of the DOH, SBOH, and LHJ employees—was 64% (3,502/5,437). The response rate for state employees was 80%. In eight of Washington's nine Public Health Emergency Preparedness and Response (PHEPR) regions, response rates were higher than 60%. The map on page 2 shows response rates by LHJ.

Confidence intervals for statewide data are generally small (1% to 2%). Small numbers of survey respondents in some regions of the state resulted in wide confidence intervals for those regions. We discuss confidence intervals in the box on this page and in the Technical Notes, which also provide a more detailed discussion of response rates and points to consider when interpreting the survey data.

A Word on Confidence Intervals

Confidence intervals estimate the variability of survey results. Specifically, the 95% confidence interval gives the range that contains the true value 95% of the time. For example, if 7% of the respondents in a particular region report they expect to work in public health for less than 5 years, and the confidence interval is ± 3, then the percent who would report planning to work less than 5 years if they were surveyed next year should be within the range of the 95% confidence intervals (i.e., 4%-10%), if there haven't been major changes in employee plans about future work. Please see the Technical Notes on page 21 for more details.

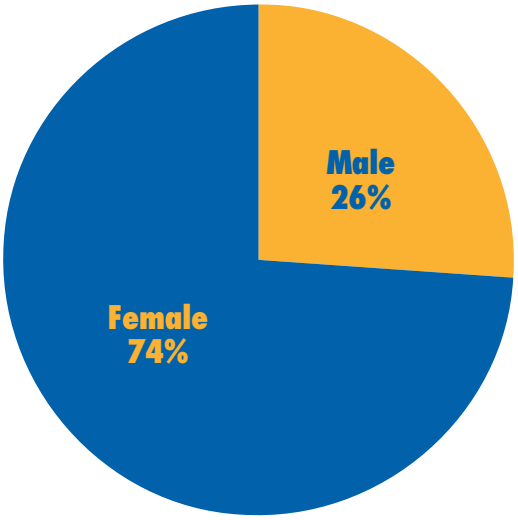
Who We Are

Our first goal for *Everybody Counts* was to create a demographic profile of Washington's public health workforce. Unless we note otherwise, the following discussion refers to characteristics of public health workers who responded to the survey.

The survey identified the following features of the state's governmental public health workers (as shown in Charts 2-5):

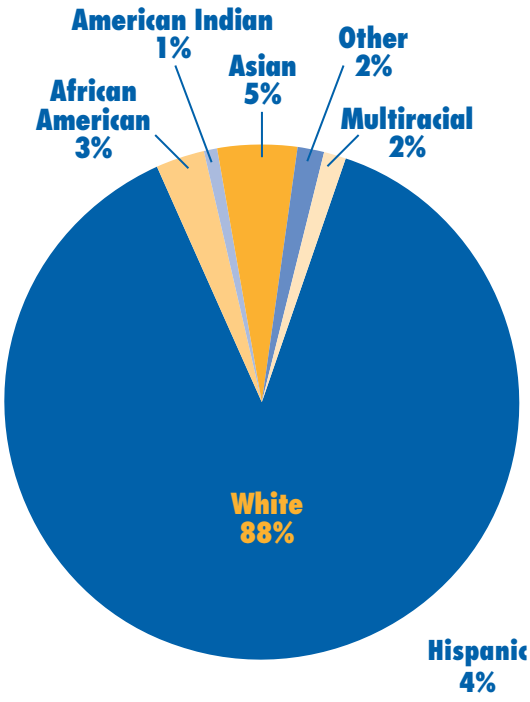
- They are mostly women (74% female).
- They are predominately White (88%), similar to Washington's adult population.
- Two-fifths are younger than 45, two-fifths are between ages 45 and 54, and the remaining fifth is 55 or older.

2. Gender of Washington's Public Health Employees*

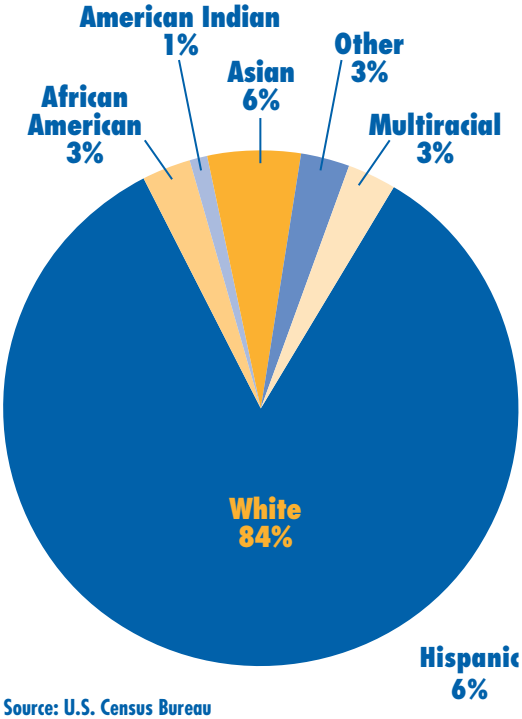


* Unless otherwise noted, graphs and charts contain data from survey respondents.

3. Race of Washington's Public Health Employees

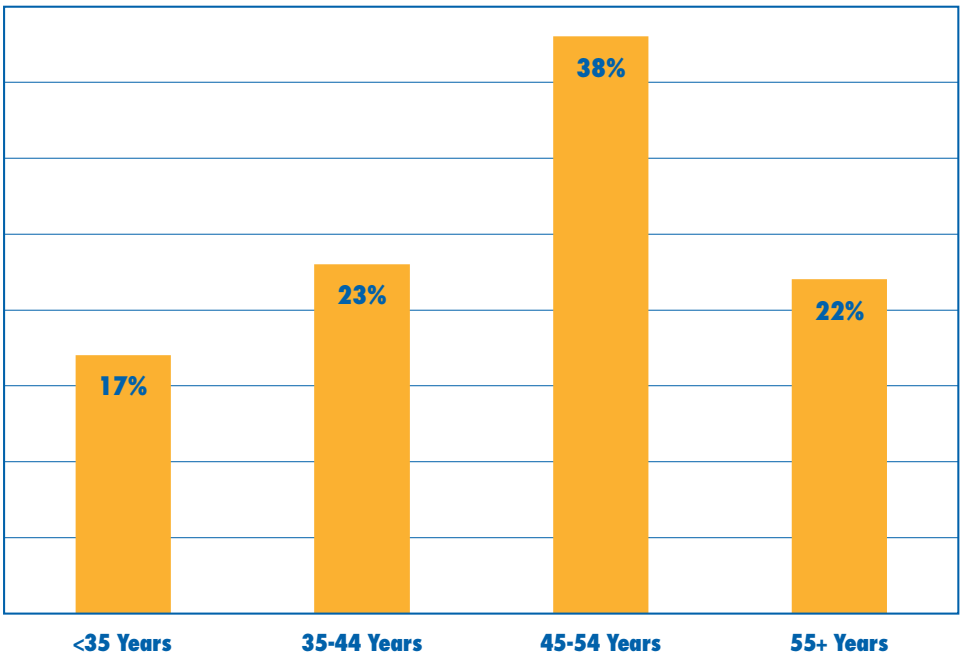


4. Race of Washington Adults 2000



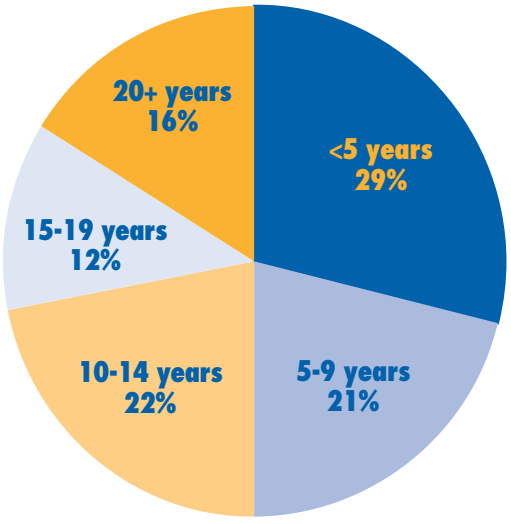
Source: U.S. Census Bureau

5. Age of Washington's Public Health Employees



The survey showed that about 3% of public health workers have disabilities, defined as requiring reasonable accommodations to perform essential functions of the position's duties and responsibilities.

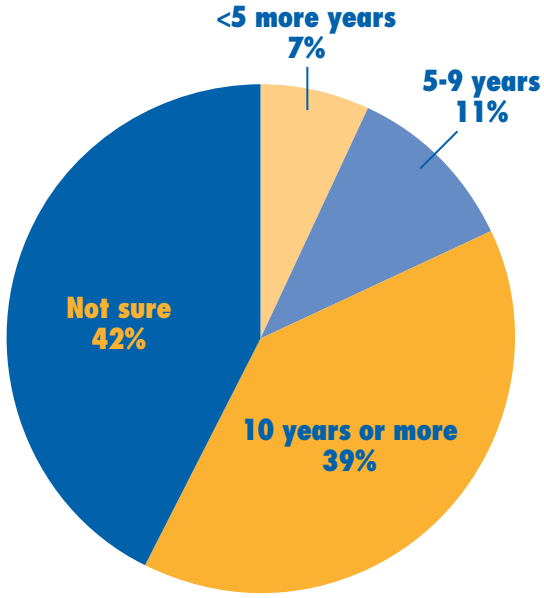
6. Years Worked In Public Health



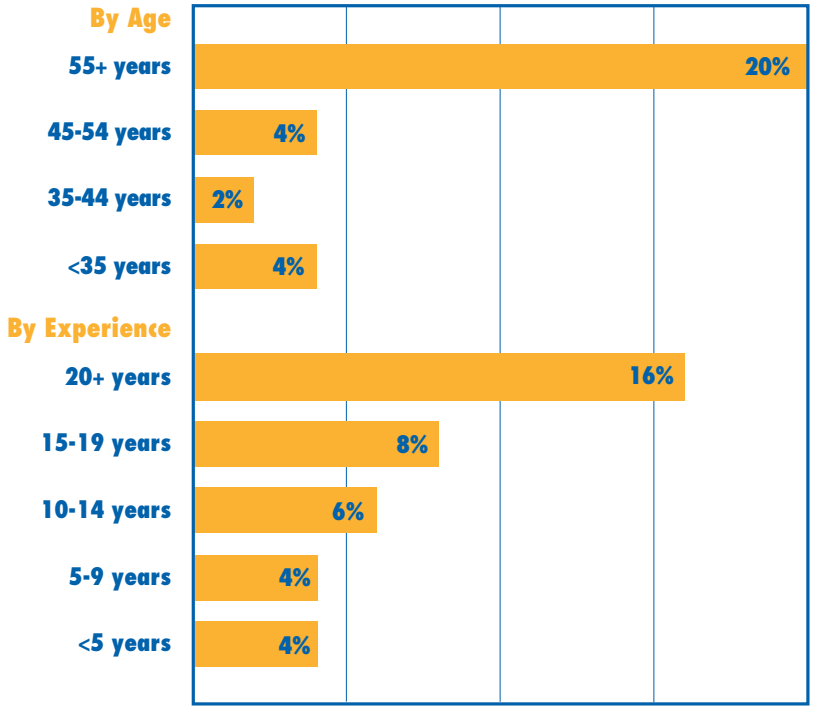
The survey also revealed how long these workers have been part of our state's public health system. As Chart 6 shows, half have worked in public health for more than a decade, and 28% have worked in the system for 15 years or more. Predictably, older workers were more likely to report longer tenure in the public health system.

Another key purpose of the survey was to learn when Washington's public health workers expect to *leave* the system—this information will inform health policy makers as they plan for our system's future and training and recruitment of new workers to replace those who retire. As summarized in Charts 7 and 8, more than a third of survey respondents (39%) said they planned to work in public health 10 years or more; 42% said they didn't know how much longer they would work in the system. About 20% of older workers (55 years and older) indicated that they expected to continue working in public health for less than five more years.

7. Years Employees Expect to Work In Public Health

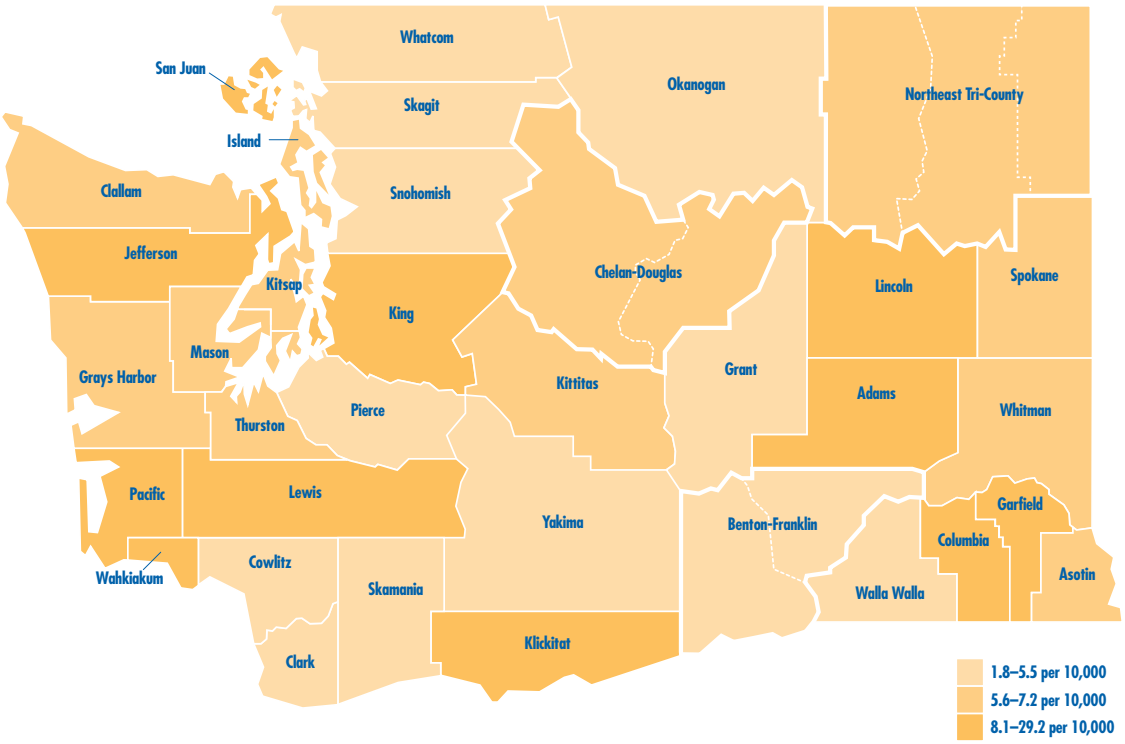


8. Employees Who Expect to Work Less Than Five More Years In Public Health, By Age and Experience



The survey also addressed the question of where public health employees work. As shown in the map on this page, the ratio of public health workers to population varies widely by county, even within similarly-sized counties. The highest number of public health workers per population is in LHJs designated as "small town/rural" areas. The second-highest ratio is in "urban" areas, followed by "mixed rural" areas and "large towns." (See the Technical Notes for a description of the urban-rural designations.) The number of public health workers in a single jurisdiction is related to the unique mix of services that the health department provides—and these services are driven by each community's needs and resources. For these and other reasons, results should be interpreted carefully.

9. Public Health Employees as a Share of Populations By Local Health Jurisdiction



See Technical Note #3 for more detailed information on each LHJ.
Source: LHJs (employment data) and U.S. Census Bureau

As shown in Chart 10, among public health workers, close to half have associate or bachelor's degrees and nearly a fourth have master's or doctoral degrees. Public health workers prepare for their jobs, the survey showed, through a wide-range of educational fields (Chart 11). The most common educational background is nursing—about 1 in 6 workers (16%) with degrees reported having nursing degrees. Our analysis showed that the share of public health employees with graduate or professional degrees varies by urban-rural designation. In LHJs in "large town" and "urban" areas, about 4% of public health employees responding to the survey reported that they had graduate or professional degrees such as those in medicine or law. In LHJs in "small town/rural" and "mixed rural" areas, this share was 1%. About 6% of state employees responding to the survey said they had professional or graduate degrees.

10. Highest Educational Degrees of Washington's Public Health Employees

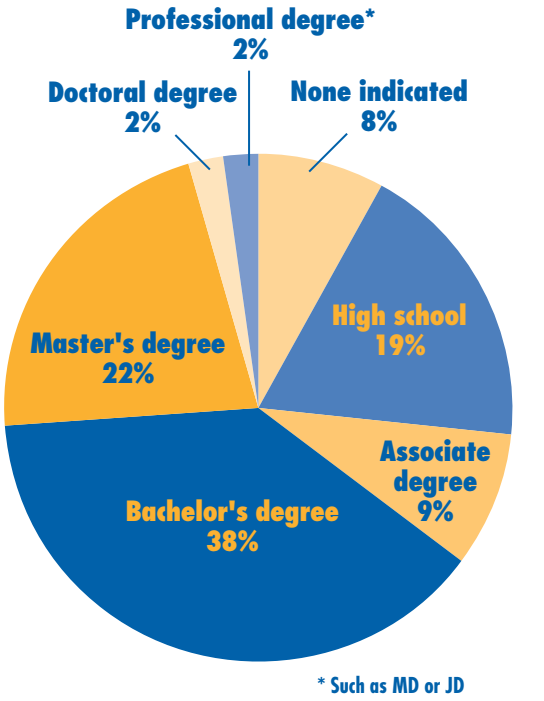
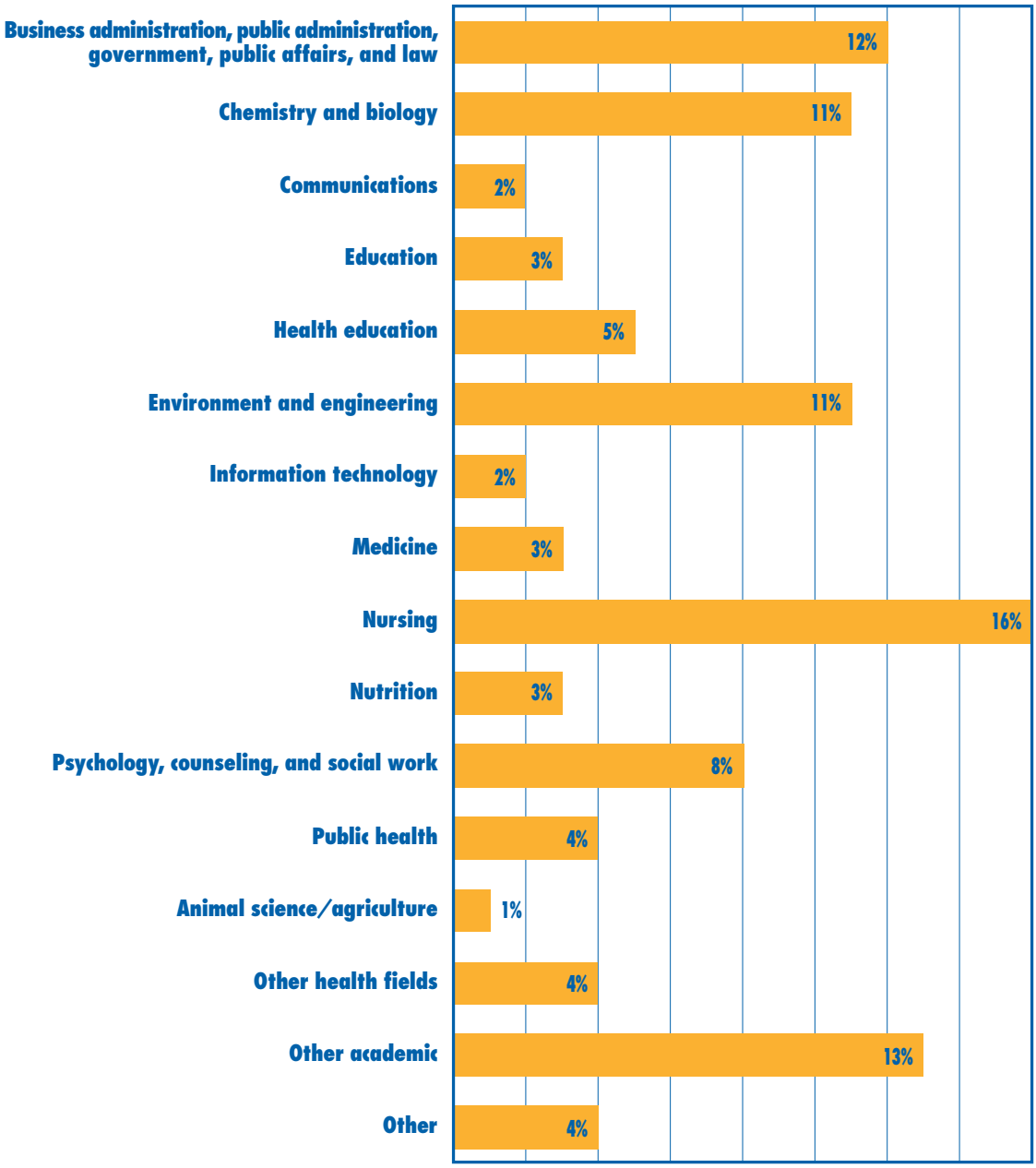


Chart 12 shows the licenses and credentials that Washington's public health workers hold, and Chart 13 summarizes the types of jobs they do.

11. Educational Fields in which Washington's Public Health Employees Hold Degrees*



* Percents are for survey respondents who have degrees (N=2,566). Respondents could select more than one field.

12. Licenses and Other Credentials Held by Public Health Employees

	Number of survey respondents with this credential statewide
DOH-licensed Professions	
Registered nurse	546
Advanced registered nurse practitioner	68
Social worker	36
Mental health counselor	34
Physician	30
Licensed practical nurse	29
Massage	15
Dental hygienist	12
Pharmacist	10
Dentist	9
Physician assistant	9
Veterinarian	6
Midwife	5
DOH-certified Professions	
Health care assistant	91
Dietitian	59
Chemical dependency professional	27
Nutritionist	23
EMS provider	21
Nursing assistant	16
Pharmacy technician	10
Radiological technician	6
DOH-registered Professions	
Counselor	107
X-ray technician	8
Nursing assistant	5
Pharmacy assistant	5
Other Credentials	
Registered sanitarian	180
Registered environmental health specialist	45
Certificate in public health	30
On-site wastewater treatment system inspector	25
Licensed professional engineer	22
Certified/registered medical technologist	18
Certified lactation consultant	16
Certified health education specialist	13
Certified medical interpreter	11
Public health nursing certificate	10
Registered dietitian	10
Teaching certificate	9

13. Job Functions Reported by Washington's Public Health Employees

Basic Definitions of Job Functions

Community and family health promotion Provides prevention, education, and early intervention for public health programs such as maternal and child health, injury prevention, health promotion, drug, alcohol, and tobacco prevention, etc.

Administration and administrative support services Provides organizational support such as financial planning or contracts, risk management, and accounting. Also includes administrative support such as customer support, staffing the front desk, handling meeting logistics, etc.

Environmental health Provides development of public policy, regulation, and education regarding environmental health issues and concerns.

Communications Provides internal and external development and implementation of public information strategies and materials.

Public health assessment Provides ongoing monitoring and surveillance, research and evaluation, and community and environmental health assessment.

Communicable and infectious disease protection Provides communicable disease outbreak investigation tracking, surveillance, and reporting.

Workforce development, performance management, training Provides human resource development and support; training and quality improvement.

Policy analysis and development Provides analysis, interpretation and communication regarding policy choices and laws and regulations.

Information and technology systems Provides technology system development and ongoing support and maintenance.

Clinical Provides one or more clinical health care services such as physician/medical, social work, nursing, nutrition, etc., in a clinical setting or in home visits.

Executive leadership Provides organizational leadership on key policy, clinical, or administrative issues.

Licensing and credentialing Provides professional licensing or facilities licensing, certification, and registration.

Human services Provides social services by those local health jurisdictions that have combined organizational structures (e.g., chemical dependency, developmental disabilities, mental health).

Public health laboratory Provides testing and screening of specimens to determine disease or toxins.

Facilities maintenance Provides maintenance of facilities and grounds.

Emergency medical services/trauma Provides and coordinates out-of-hospital emergency medical response and care to acute illness and trauma patients.

What We Do

The top three job functions among Washington's public health workers are community and family health promotion (23%), administration and administrative support services (also 23%), and environmental health (19%). Many people reported more than one job function.

Analysis of the survey data to match educational fields with job functions reveals several patterns:

- Nurses make up nearly half of the system's clinical workers and a fourth of those working in health promotion and communicable disease positions. They also constitute the largest share (about one in five) of workers who perform workforce development and performance management functions.
- Relatively few workers have educational backgrounds specifically in public health, typically a Master's in Public Health (MPH) degree.
- Survey respondents who studied chemistry/biology or environmental science make up half of the state public health system's workers in environmental health and half of the workers in the public health laboratories.
- People with backgrounds in psychology, social work, or counseling make up a third of workers in human services in public health agencies.
- People with backgrounds in medicine perform a variety of functions in the state's public health system, including executive management, communications, prevention, and policy development.
- No single educational background predominates among people who do executive, policy assessment, or licensing functions.

14. Public Health Employees' Job Functions by Educational Fields

JOB FUNCTION / EDUCATIONAL FIELD	Business/public administration, etc.	Chemistry and biology	Communications	Education	Health education/physical education	Environment/engineering	Information technology	Medicine	Nursing	Nutrition	Psychology, counseling, social work	Public health	Animal science/agriculture	Other health fields	Other academic	No degree indicated	Degree but no field indicated	Total respondents*
Executive	36	43	5	15	19	24	<5	19	41	6	20	18	6	23	29	37	58	305
Policy	55	47	8	15	28	49	<5	16	33	16	31	26	9	18	50	38	66	389
Administration	117	38	5	14	21	25	10	6	30	7	39	17	<5	19	70	354	95	800
Information tech.	29	36	<5	<5	11	23	30	6	15	<5	18	15	5	12	31	98	52	334
Communications	32	48	17	16	37	50	6	10	47	16	35	39	10	17	58	67	86	474
Laboratory	<5	32	<5	<5	<5	10	<5	<5	<5	<5	<5	<5	<5	<5	<5	13	12	76
Human services	12	<5	<5	6	<5	<5	<5	<5	7	<5	32	<5	<5	5	15	12	21	97
Workforce dev.	44	48	6	11	28	30	5	8	72	14	34	25	5	22	49	51	59	405
Assessment	25	57	6	13	38	57	7	12	63	19	45	45	7	24	55	48	74	456
Communicable dis.	18	51	6	12	27	19	<5	16	115	6	27	34	<5	21	47	47	83	437
Environmental	34	151	<5	11	24	213	<5	14	17	10	10	26	25	22	59	73	109	661
Health promotion	40	31	9	23	62	10	5	17	218	50	71	41	<5	32	75	95	174	813
Clinical	10	6	<5	6	8	<5	<5	13	131	13	23	9	<5	13	18	20	74	298
Licensing	16	11	<5	6	<5	10	<5	<5	13	<5	6	<5	<5	<5	9	51	23	145
Total respondents*	294	291	38	77	122	273	49	64	406	82	200	112	36	112	343	935	581	3,501

* Numbers do not sum to the totals because some respondents reported more than one job function or educational field and because EMS and facilities maintenance were omitted due to small numbers.

Relatively large numbers of people reported a wide variety of other educational fields, including other physical and social sciences, and arts and humanities. Nearly half of survey respondents (45%) indicated that they had experienced working in the health care industry in addition to public health.

Looking Ahead

Everybody Counts is a first step to better understanding of Washington's governmental public health workforce. We hope to repeat the census on a regular basis, building a database we can use to track trends in workforce composition over time and help us to anticipate issues that need a response. In addition, we hope to expand the reach of this process to enumerate community health workers who work outside of governmental public health agencies—yet are vital to promoting and protecting the public's health. This expanded information will be especially valuable for local health leaders seeking ways to improve access to needed community services.

Following are some of the policy issues that can be addressed with continued attention to our workforce composition, educational background, and job functions.

- **Increasing diversity**: Throughout the state, our population is becoming more diverse, representing a broader range of language groups, cultures, and ethnic communities. Providing culturally sensitive services will require training of the current workforce to provide services and materials in the context of an individual's or community's culture, language, and social and historical circumstances. Community-specific data can help us focus these efforts in the best direction. Increasing diversity along with disparities in health status across populations also signals a need for recruitment efforts to build a

future workforce that reflects the composition of the population it serves.

- **Preparing for retirement transitions**: The survey shows that nearly 1 in 6 public health workers with the most experience (20+ years) expect to leave the field within five years. And 42% of public health employees say they are unsure when they will leave work in public health—a share that increases to about 60% among workers younger than 35. These data suggest that public health agencies will benefit from concerned attention to succession planning and policies that increase workers' commitment to stay in public health, particularly in those areas that are projected to experience the greatest workforce shortfalls.

- **Forecasting educational needs**: Washington's public health workforce represents a wide range of educational preparation. Combining the results of this baseline with what we know about trends in public health, we can begin to analyze educational needs for the future. For example, a trend toward increased efforts to prevent chronic disease calls for specialists skilled in health education, community mobilization, and evaluation research. Knowing how many such specialists are already at work in the system helps estimate the gap and set specific targets for the years to come.

- **Estimating needed workforce size**: Administrators and Board of Health members frequently ask how many workers are needed in a given job category. Today, we simply do not have the answers because there is a wide variation in the complement of services provided by public health agencies and the community organizations with which we work. Once we begin to document the workers engaged in public health at the community level, we will be able to compare experi-

ences and gain a better understanding of how many workers it takes to support the results communities expect.

- **Specifying training needs**: Public health programs rest on a rapidly changing scientific foundation. It is essential that today's workers have the opportunity to apply new knowledge throughout their careers, whether that knowledge extends from clinical medicine, environmental or biological science, social science, or technological innovation.

Future surveys can help us specify training needs in different areas of public health practice and ensure that workers have the educational access they need to perform their jobs at the highest level. This information will continue to inform our planning and all our efforts to sustain and improve high quality, effective public health services.

Technical Notes

The Technical Notes give additional information about the following topics:

1. Response rates
2. Study limitations
3. Public health employees as a share of populations
4. Rural-urban codes
5. Data cleaning
6. Coding of educational fields

1. Response rates (Map #1 on page 2) The statewide response rate, calculated as the number of surveys after cleaning, divided by the total number of state and local agency employees, as reported by the agencies to DOH, was 3,502/5,437 = 64.4%.

We asked agencies to include all employees who worked in the agency, not just public health professionals, so both the numerator and denominator should include the full range of employees at state and local public health agencies. The response rate might be slightly lower than the actual response rate if some employees who worked in more than one agency were counted in the denominator more than once, but this should not affect it by more than about 0.5%. We calculated regional response rates (below) by dividing the number of surveys in a Public Health Emergency Preparedness and Response (PHEPR) region by the total employees in the region, and they might also be underestimates if employees are counted more than once in the denominator. In general, nongovernmental public health contractors were not included in the survey. Some LHJ employees serve as contractors for other LHJs. These were counted with the employing LHJ; this especially affected Skamania County.

LHJ and regional response rates are provided in the following table. (To view map: http://www2.doh.wa.gov/phip/survey/everybodycounts/)

Public Health Emergency Preparedness and Response (PHEPR) Region	Number of surveys	Number of employees	Response rate
Region 1	**268**	**439**	**61.0%**
Island County Health Department	46	49	94%
San Juan County Department of Health and Community Services	26	31	84%
Skagit County Department of Health	33	57	58%
Snohomish Health District	89	215	41%
Whatcom County Health Department	75	87	86%
Region 2	**194**	**222**	**87.4%**
Clallam County Department of Health and Human Services	40	44	91%
Jefferson County Health and Human Services	36	37	97%
Kitsap County Health District	120	141	85%
Region 3	**234**	**275**	**85.1%**
Grays Harbor County Public Health and Social Services Department	41	47	87%
Lewis County Public Health	45	60	75%
Mason County Department of Health Services	30	30	100%
Pacific County Public Health and Human Services Department	13	17	76%
Thurston County Public Health and Social Services Department	116	121	96%
Region 4	**146**	**194**	**75.3%**
Clark County Health Department	109	153	71%
Cowlitz County Health Department	32	34	94%
Skamania County Health Department	N <5	N <5	
Wahkiakum County Department of Health and Human Services	5	5	100%
Region 5 Tacoma-Pierce County Health Department	**205**	**292**	**70.2%**
Region 6 Public Health–Seattle & King County	**811**	**2,000**	**40.6%**
Region 7	**90**	**131**	**68.7%**
Chelan-Douglas Health District	32	61	52%
Grant County Health District	19	24	79%
Kittitas County Health Department	24	24	100%
Okanogan County Health District	15	22	68%

continues next page

Public Health Emergency Preparedness and Response (PHEPR) Region	Number of surveys	Number of employees	Response rate
Region 8	**155**	**186**	**83.3%**
Benton-Franklin Health District	83	100	83%
Klickitat County Health Department	16	19	84%
Walla Walla County Health Department	18	26	69%
Yakima Health District	39	41	95%
Region 9	**255**	**387**	**65.9%**
Adams County Health District*	9	14	64%
Asotin County Health District	12	12	100%
Columbia County Public Health District	6	6	100%
Garfield County Health District	7	7	100%
Lincoln County Health Department	10	12	83%
Northeast Tri-County Health District (Ferry, Pend Oreille, Stevens)	18	41	44%
Spokane Regional Health District	188	272	69%
Whitman County Health Department	9	23	39%
# indicated local employee but county not indicated, minus # indicated employment in two regions	89		
State employees (DOH, SBOH)	**1,054**	**1,311**	**80.4%**
Statewide total	**3,501**	**5,437**	**64.4%**

* **Adams County Health District became Adams County Health Department on January 1, 2004.**

The state's largest public health agency, Public Health–Seattle & King County (PHSKC) had the highest number of total respondents of any LHJ (811); however, its response rate was low (40.6%). To examine possible bias, we compared gender and race composition of the PHSKC surveys to employee characteristics provided by PHSKC. The percent female was similar for survey respondents and PHSKC employees. However, non-white employees were under-represented among survey participants compared to PHSKC employees. Non-whites had a lower response rate (29%) compared to whites (46%). Therefore, results for PHSKC may be biased by non-response, in that non-whites are proportionally under-represented. There may be other sources of bias as well, such as under-representation of employees performing particular job functions, that we were unable to assess due to a lack of comparison data.

To examine possible effects on statewide rates, we compared statewide percents for gender, race, age, years worked in public health, years expected to work in public health, and 16 job functions to the same percents if PHSKC data are excluded. None of the percents changed by more than 3 percentage points (for percent non-white). Unless non-respondents were dramatically different from respondents, the low response rate in PHSKC does not appear likely to have dramatically affected the statewide results. If non-white employees were under-represented among survey participants statewide, however, then the racial distribution of survey respondents may underestimate the proportions of races other than white in the public health workforce.

2. Study limitations

- The survey was intended to include all employees at DOH, the Washington State Board of Health (SBOH), and LHJs. Individuals who perform public health functions but work at non-public health agencies, were not included. Therefore, the results may under-estimate the actual available workforce for some public health functions.
- Results are based on self-reports, so if respondents reported incorrectly, the data would be incorrect.
- The survey represents a "point in time" snapshot, and trend data are not available.
- The survey is descriptive only and does not measure performance.
- Results may be affected by incomplete responses or other coding issues, especially for open-ended questions. For example, the section on licenses and other credentials included check-off boxes only for those credentials regulated by DOH. Other credentials important to public health (e.g, Registered Sanitarian) had to be written in under "other license or credential." Also, for some items, not checking off the item or filling in the blank was coded as not possessing the characteristic or credential, and some of these codes may have actually reflected missing data.
- The survey had low power for detecting differences in rural areas or regions because of small numbers in these areas and resulting wide confidence intervals. These confidence intervals are provided in the tables showing regional data (available online at http://www2.doh.wa.gov/phip/survey/everybodycounts/). Confidence intervals for statewide data were generally 1% or less for overall percents and 2%-3% for breakdowns by large categories such as age. Confidence intervals in the more populous regions were similar. For some breakdowns (such as job functions by educational field) and for less populous regions, confidence intervals were much broader (e.g., 9%).

3. Public health employees as a share of populations (Map #9 on page 10)

We calculated the rates of LHJ employees as fractions of the populations by dividing the number of employees provided by the LHJ by the total population in the county or counties in that LHJ based on the 2000 census. In other words, unlike most of the results depicted in this report, these results were based not on reports from survey respondents but on the number of employees reported by the LHJ.

County	Employees	Population	Rate	Rate per 10,000
Adams County Health District	14	16,428	0.000852204	8.522035549
Asotin County Health District	12	20,551	0.000583913	5.839131916
Benton-Franklin Health District	100	191,822	0.000521317	5.213166373
Chelan-Douglas Health District	61	99,219	0.000614802	6.148016005
Clallam County Department of Health and Human Services	44	64,525	0.000681906	6.819062379
Clark County Health Department	153	345,238	0.000443173	4.43172536
Columbia County Public Health District	6	4,064	0.001476378	14.76377953
Cowlitz County Health Department	34	92,948	0.000365796	3.657959289
Garfield County Health District	7	2,397	0.002920317	29.20317063
Grant County Health District	24	74,698	0.000321294	3.212937428
Grays Harbor County Public Health and Social Services Department	47	67,194	0.000699467	6.994672143
Island County Health Department	49	71,558	0.000684759	6.847592163
Jefferson County Health and Human Services	37	25,953	0.001425654	14.25654067
Kitsap County Health District	141	231,969	0.00060784	6.078398407
Kittitas County Health Department	24	33,362	0.000719381	7.193813321
Klickitat County Health Department	19	19,161	0.000991598	9.915975158
Lewis County Public Health	60	68,600	0.000874636	8.746355685
Lincoln County Health Department	12	10,184	0.001178319	11.78318932
Mason County Department of Health Services	30	49,405	0.000607226	6.072259893
Northeast Tri-County Health District (Ferry, Pend Oreille, Stevens)	41	59,058	0.000694233	6.942327881
Okanogan County Health District	22	39,564	0.000556061	5.560610656
Pacific County Public Health and Human Services Department	17	20,984	0.000810141	8.101410599
Public Health–Seattle & King County	2,000	1,737,034	0.001151388	11.51387941
San Juan County Department of Health and Community Services	31	14,077	0.002202174	22.02173759
Skagit County Department of Health	57	102,979	0.000553511	5.5351091
Skamania County Health Department	2	9,872	0.000202593	2.025931929
Snohomish Health District	215	606,024	0.000354771	3.547714282
Spokane Regional Health District	272	417,939	0.000650813	6.508126784
Tacoma-Pierce County Health Department	292	700,820	0.000416655	4.166547758
Thurston County Public Health and Social Services Department	121	207,355	0.00058354	5.835403053
Wahkiakum County Department of Health and Human Services	5	3,824	0.001307531	13.07531381
Walla Walla County Health Department	26	55,180	0.000471185	4.71185212
Whatcom County Health Department	87	166,814	0.000521539	5.215389596
Whitman County Health Department	23	40,740	0.000564556	5.645557192
Yakima Health District	41	222,581	0.000184203	1.842026049

4. Rural-urban codes

Rural-urban codes were based on the following classifications:
Small town/rural: Adams, Columbia, Garfield, Jefferson, Klickitat, Lincoln, Northeast Tri-County, Okanogan, Pacific, San Juan, Wahkiakum
Mixed rural: Clallam, Grays Harbor, Island, Mason, Skagit, Skamania
Large town: Asotin, Chelan-Douglas, Grant, Kittitas, Lewis, Walla Walla, Whitman
Urban: Benton-Franklin, Cowlitz, King, Kitsap, Pierce, Snohomish, Spokane, Clark, Thurston, Whatcom, Yakima
More information is available in "Standards for Public Health in Washington State: Baseline Evaluation Report" (2002), available online at http://www.doh.wa.gov/phip/Standards/Reports.htm.

5. Data cleaning

Prior to analysis, we discarded 58 surveys that appeared to represent duplicates based on names, job classifications, age, sex, and other items. We also discarded 16 surveys that we were unable to categorize as working as either state or local public health employees. We did not discard 93 surveys that indicated working at a local organization but did not specify the county location; so these surveys are counted in the statewide totals but not in regional breakdowns. We also recoded state and county employment designations where there appeared to be discrepancies (e.g., working in up to 39 counties). Respondents reporting EMS job functions who also reported working in counties other than King County were examined individually, and based on the information provided by the respondents as to their responsibilities (e.g., regional emergency response coordinator), recoded to remove the EMS functions because these functions were not intended to be included.

6. Coding of educational fields

Open-ended questions asked respondents to indicate type of degree and fields of study at each of these levels: a) Some high school, high school diploma, or GED; b) Associate/junior college degree or diploma (e.g., AA, associate degree, or diploma in nursing); c) Bachelor's degree (e.g., BA, BS, BSN); d) Master's degree (e.g., MS, MA, MPH, MHA, MSW, MSN); e) Doctoral degree (e.g., PhD, DrPH, EdD); f) Professional degree (e.g., MD, DDS, DO, JD, DVM); g) Certificate in public health; h) Certified Public Accountant (CPA); i) Certified Financial Planner (CFP); and j) Other degrees (please list).

We coded fields of study by listing non-redundant responses and then grouping them into related categories. We included all fields for which the respondent indicated he or she had received at least an associate degree. Some respondents had more than one field of study (e.g., a Bachelor's degree in one field and a Master's degree in another field) or indicated a degree but not a field of study. Thus, the numbers in each field do not sum to the total. For those fields of study that clearly corresponded to a public health function (e.g., communications as a field and communication as a public health function), we coded the field separately. We reported certificates in public health in the "licenses and other credentials" table. Otherwise, we grouped fields into conceptually related categories. Educational levels (i.e., highest degrees) were reported separately. This process led to the following categories: Nursing; Business/public administration (including government, public affairs, and law); chemistry/biology; environment/engineering (including environmental science, geology, forestry, and engineering); psychology, counseling, and social work; public health; nutrition; medicine; information technology; communications; animal science/agriculture (including veterinary); education; health education/physical education; other health care (including dental, health care administration, physical therapy, etc.), and other academic (including other physical and social sciences, arts and humanities). Additional detail is available on request.

Acknowledgments

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We recognize the contributions of the following DOH staff members:

Don Martin and **Vonda Witley**, *design and production*

Kay Koth, *report proofreading*

Jill Hanks, *marketing and distribution*

Doug Keck, **Steve Macdonald**, and **Jack Jourden**, *survey development*

Susan Shoblom, **Pam Lovinger**, and **Bonnie King**, *Health Professions Licensing and Credentialing*

Torie Hernandez, *data-cleaning*

Ramona Nelson, *constructing tables*

Danny Francis, *survey application*

Marie Flake, *overall guidance and direction*

Dai Le, **Danny Francis**, and **Bob Clark**, *WWW technical*

Project Consultants

Alice Porter, *editorial services*

Cassandra McElfish, *coding*

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